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EXAMINER	
KRUSE, DAVID H	
ART UNIT	PAPER NUMBER
1638	16

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Please find below and/or attached an Office communication concerning this application or proceeding.

File Copy

Office Action Summary	Application No.	Applicant(s)	
	09/529,239	DOUTRIAUX ET AL.	
	Examiner	Art Unit	
	David H Kruse	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *4-6,24-28 and 34-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-23 and 29-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-3, 7-23 and 29-33 drawn to an *Arabidopsis thaliana* AtMSH3 (SEQ ID NO: 19) in Paper No. 15, filed 28 February 2002, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 4-6, 24-28 and 34-36 and subject matter directed to an *Arabidopsis thaliana* AtMSH6 (SEQ ID NO: 31) are withdrawn from further consideration pursuant to 37 CFR § 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 15.

3. This application contains claims 4-6, 24-28 and 34-36 drawn to an invention nonelected with traverse in Paper No. 15. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR § 1.144). See MPEP § 821.01.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR § 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 § CFR 1.48(b) and by the fee required under 37 CFR § 1.17(i).

Sequenc Compliance Rules

5. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR § 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR §§ 1.821 through 1.825. Specifically page 12, lines 36 and 37, of the Specification, comprises disclosures of amino acid sequences not identified by a SEQ ID NO. Applicant must submit a CRF copy and paper copy of the Sequence Listing, a statement that the content of the paper and computer readable copies are the same and where applicable include no new matter as required by 37 C.F.R. §§ 1.821(e) or 1.821(f) or 1.821(g) or 1.825(d), as well as an amendment directing its entry into the specification.

Failure to comply with these requirements in response to this Office Action will result in ABANDONMENT of the application under 37 CFR § 1.821(g).

Specification

6. The abstract of the disclosure is objected to because it does not commence on a separate sheet in accordance with 37 CFR § 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

7. Misnumbered claims 25(duplicate)-35 have been renumbered claims 26-36 as requested in the Preliminary Amendment received 10 April 2000 and entered 27 October 2000, and per Rule 1.126.

Claim Objections

8. Claims 3, 11, 30 and 31 are objected to because of the following informalities: The instant claims are directed to an invention non-elected in Paper No. 15, and should be amended accordingly.

Claims 29, 32 and 33 are objected to because they are dependent upon a claim directed to a non-elected invention.

Claim 29 is objected to under 37 CFR § 1.75(c) as being in improper form because a multiple dependent claim should refer to the other claims in the alternative only. See MPEP § 608.01(n).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

10. Claims 1-3, 7-23 and 29-33 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

At claim 1, the phrase "a polynucleotide sequence encoding a polypeptide functionally involved in the DNA mismatch repair system of a plant" is indefinite because it is unclear what the metes and bounds of the claim are. The phrase "functionally involved" does not sufficiently define "a polynucleotide sequence".

At claims 2 and 3, the phrase "A DNA molecule" is indefinite and should read -- The DNA molecule -- in referring to claim 1.

At claims 2, 3, 7, 8, 11 and 13, the term "homologous" is indefinite because it does not state the metes and bounds of the claimed invention. The art teaches that polypeptide sequences cannot exhibit a particular "level of homology" or "percent homology" because "homology" is a qualitative means and not a quantitative means of comparing two sequences, one to the other (see Reeck *et al* 1987, Cell 50:667).

At claim 7, lines 3 and 6, the phrases "capable of interfering with the expression of a plant polynucleotide sequence" and "capable of disrupting the DNA mismatch repair system of a plant" are indefinite because they do not denote a positive or definite property of the claimed invention, merely a suggestion of function.

At claim 8, line 1, the phrase "A DNA molecule" is indefinite and should read -- The DNA molecule -- in referring to claim 7. At line 2, the phrase "capable of" is indefinite because it does not denote a positive or definite property of the claimed invention, merely a suggestion of function.

At claim 9, line 1, the phrase "A DNA molecule" is indefinite and should read -- The DNA molecule -- in referring to claim 8. At lines 1-2, the phrase "capable of" is indefinite because it does not denote a positive or definite property of the claimed invention, merely a suggestion of function.

At claim 10, line 1, the phrase "A DNA molecule" is indefinite and should read -- The DNA molecule -- in referring to claim 7. At line 1, the phrase "capable of" is indefinite because it does not denote a positive or definite property of the claimed invention, merely a suggestion of function.

At claim 11, line 1, the phrase "A DNA molecule" is indefinite and should read -- The DNA molecule -- in referring to claim 10.

At claim 12, line 1, the phrase "A DNA molecule" is indefinite and should read -- The DNA molecule -- in referring to claim 10. At line 2, the phrase "capable of causing overexpression" is indefinite because it does not denote a positive or definite property of the claimed invention, merely a suggestion of function. In addition, it is unclear form the instant claim how "a regulation element" is operably linked to the DNA molecule according to claim 10.

At claim 13, the phrases "capable of interfering with the expression of a plant polynucleotide sequence" at line 3 and "capable of disrupting the DNA mismatch repair system of a plant" at line 6 are indefinite because they do not denote a positive or definite property of the claimed invention, merely a suggestion of function. At line 5, the phrase "thereby disabling said plant polynucleotide sequence" is indefinite because it is unclear what the metes and bounds of "disabling" are. At line 8, the phrase "capable of functioning" is indefinite.

At claim 14, line 1, the phrase "A chimeric gene" should read -- The chimeric gene -- in referring to claim 13. In addition, claim 14 is in an improper Markush format, the phrase at line 2, "selected from", should read -- selected from the group consisting of --.

At claim 15, line 1, the phrase "A chimeric gene" should read -- The chimeric gene -- in referring to claim 13. At line 2, the phrase "capable of disrupting the DNA mismatch repair system of a plant" is indefinite because it does not denote a

positive or definite property of the claimed invention, merely a suggestion of function. At line 3, the phrase "capable of causing overexpression" is indefinite because it does not denote a positive or definite property of the claimed invention, merely a suggestion of function.

At claim 16, line 1, the phrase "A chimeric gene" should read -- The chimeric gene -- in referring to claim 13.

At claim 17, line 1, the phrase "a chimeric gene" should read -- the chimeric gene -- in referring to claims 13-16.

At claim 18, the phrase "a plasmid or vector" should read -- the plasmid or vector -- in referring to claim 17.

At claim 19, the phrase "a cell" should read -- the cell -- in referring to claim 18.

At claim 20, line 1, the phrase "A plant" should read -- The plant -- in referring to claim 19.

Claim 20 is rejected as indefinite for being in improper Markush format. The Office recommends the use of the phrase "selected from the group consisting of..." with the use of the conjunction "and" rather than "or" in listing the species. See MPEP 2173.05(h).

Claim 21 is rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: inactivating said DNA mismatch repair system of a plant cell. Furthermore, because the claims to which claim 21 are dependent are indefinite as to "a polypeptide functionally involved in the DNA mismatch

repair system of a plant" as recited in claim 1, for example, the phrase "at least partially inactivating a DNA mismatch repair system of a plant cell" is indefinite because it is unclear what the metes and bounds of this limitation are. The phrase "a DNA mismatch repair system" is unclear at line 1 because it is unclear to which "DNA mismatch repair system" the claimed process is directed. The process step at line 3, "causing said DNA sequence to express" does not denote a positive method step because expression is a natural consequence of "transforming or transfecting" at line 2.

Claim 22 is rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: inactivating said DNA mismatch repair system of a plant cell. Furthermore, at line 2, the phrase "a chimeric gene" should read -- the chimeric gene -- in referring to claims 13-16. The phrase "a DNA mismatch repair system" is unclear at line 1 because it is unclear to which "DNA mismatch repair system" the claimed process is directed. The process step at line 3, "causing said DNA sequence to express" does not denote a positive method step because expression is a natural consequence of "transforming or transfecting" at line 2.

Claim 23 is rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: inactivating said DNA mismatch repair system of a plant cell. Furthermore, at line 2, the phrase "a plasmid or vector" should read -- the plasmid or vector -- in referring to claim 17. The phrase "a DNA mismatch repair system" is unclear at line 1 because it is unclear to which "DNA

mismatch repair system" the claimed process is directed. The process step at line 3, "causing said DNA sequence to express" does not denote a positive method step because expression is a natural consequence of "transforming or transfecting" at line 2.

At claim 29(renumbered), line 1, the phrase "A process" should read -- The process -- in referring to the claim upon which it depends. At line 2, the phrase "a chimeric" should read -- the chimeric -- in referring to claim 13. At line 3, the phrase "permitting...to express" is in definite because it is unclear how one permits expression. At line 4, the phrase "capable of interfering" is indefinite because it does not denote a definite limitation and it is unclear what the metes and bounds of "interfering" are. At lines 5-6, the phrase "capable of disrupting the DNA mismatch repair system" is indefinite because it does not denote a definite limitation and it is unclear what the metes and bounds of "disrupting" are.

At claim 30, the phrase "A process" should read -- The process -- in referring to claim 29.

At claim 31, the phrase "A process" should read -- The process -- in referring to claim 29.

At claim 32, the phrase "A process" should read -- The process -- in referring to claim 28.

At claim 33, the phrase "A process" should read -- The process -- in referring to claim 32.

11. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 1-3, 7-23 and 29-33 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant claims an isolated and purified DNA molecule comprising a polynucleotide sequence encoding a polypeptide functionally involved in the DNA mismatch repair system of a plant, said polypeptide being homologous to a mismatch repair polypeptide of a yeast or a human or to AtMSH3 (SEQ ID NO: 19), a chimeric gene comprising said DNA molecule, a plasmid comprising said chimeric gene and a plant comprising said plasmid, and method for their use

Applicant describes the polypeptide AtMSH3 in SEQ ID NO: 19 and an isolated DNA molecule encoding said polypeptide that is involved in the mismatch repair system of *Arabidopsis thaliana*, and chimeric genes, plasmids, vectors and plants comprising said DNA molecule (see Example 1 on pages 12-15 of the specification).

Applicant does not describe, within the elected invention, other DNA molecules comprising a polynucleotide sequence encoding a polypeptide functionally involved in the DNA mismatch repair system of a plant.

Hence, it is unclear from the instant specification that Applicant was in possession of the invention as broadly claimed. The instant claims are directed to isolated DNA molecules and constructs claimed merely by function, and the instant specification fails to adequately describe the claimed genus of polynucleotide

sequences encoding a polypeptide functionally involved in the DNA mismatch repair system of a plant. See *University of California V. Eli Lilly and Co.*, 43 USPQ2d 1398 (Fed. Cir. 1997), which teaches that the disclosure of a process for obtaining cDNA from a particular organism and the description of the encoded protein fail to provide an adequate written description of the actual cDNA from that organism which would encode the protein from that organism, despite the disclosure of a cDNA encoding that protein from another organism. See *Amgen inc. v Chagai Pharmaceutical co.*, 18 USPQ 2d 1016 (Fed. Cir. 1991), which teaches that the conception of a chemical compound requires the inventor to be able to define the compound so as to distinguish it from other materials, and to describe how to obtain it rather than simply defining it solely by its principle biological property; thus, when an inventor of a gene, which is a chemical compound albeit a complex one, is unable to envision detailed constitution of the gene so as to distinguish it from other materials, as well as a method of obtaining it, the conception is not achieved until a reduction to practice has occurred, and until after the gene has been isolated.

13. Claims 1-3, 7-23 and 29-33 are rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for an isolated DNA molecule that encodes a polypeptide having the sequence of SEQ ID NO: 19, compositions comprising said isolated DNA molecule and methods of using said DNA molecule in *Arabidopsis thaliana*, does not reasonably provide enablement for any isolated DNA molecule that encodes a polypeptide functionally involved in the DNA mismatch repair system of a plant, DNA molecules that encodes a polypeptide that are homologous to

Applicant's SEQ ID NO: 19, or compositions comprising said DNA molecule or methods of use. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Applicant claims an isolated and purified DNA molecule comprising a polynucleotide sequence encoding a polypeptide functionally involved in the DNA mismatch repair system of a plant, said polypeptide being homologous to a mismatch repair polypeptide of a yeast or a human or to AtMSH3 (SEQ ID NO: 19), a chimeric gene comprising said DNA molecule, a plasmid comprising said chimeric gene and a plant comprising said plasmid.

Applicant teaches the polypeptide AtMSH3 in SEQ ID NO: 19 and an isolated DNA molecule encoding said polypeptide that is involved in the mismatch repair system of *Arabidopsis thaliana*, and chimeric genes, plasmids, vectors and plants comprising said DNA molecule (see Example 1 on pages 12-15 of the specification).

Applicant does not teach, within the elected invention, other DNA molecules comprising a polynucleotide sequence encoding a polypeptide functionally involved in the DNA mismatch repair system of a plant, other than the AtMSH3 taught in SEQ ID NO: 19.

In re Wands, 858F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988) lists eight considerations for determining whether or not undue experimentation would be necessary to practice an invention. These factors are: the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of

working examples of the invention, the nature of the invention, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art, and the breadth of the claims.

Applicant only teaches the AtMSH3 (SEQ ID NO: 19) protein of *Arabidopsis thaliana* that is involved in the DNA mismatch repair system of the plant. In addition, Applicant only provides general guidance, based on conserved sequences in human and yeast analogues, on how to isolate similar proteins involved in the DNA mismatch repair system of a plant having a function similar to the AtMSH3 of *Arabidopsis* (see the paragraph spanning pages 12-13 of the specification). The art teaches that although a large body of information exists for bacterial, yeast and mammalian DNA repair system, there is little experimental evidence for defining similar reactions in plant cells (see Rice *et al* 2000, Plant Physiology 123:427-437, specifically page 427, right column). Applicant has only provided evidence for a similar function of the AtMSH3 protein, in plants, and has not taught how to recognize all polypeptides functionally involved in the DNA mismatch repair system of a plant. Hence, it would have required undue trial and error experimentation by one of skill in the art at the time of Applicant's invention to screen through a myriad of plant genes in order to isolate those DNA molecules that encode a polypeptide functionally involved in the DNA mismatch repair system of a plant, even those polypeptides that are similar to a mismatch repair polypeptide of a yeast or of a human as broadly claimed in claims 1-3 and 7-17, and transform a myriad of plants using a myriad of variations of the isolated DNA molecules as broadly claimed

in claims 18-20, in order to practice the processes of claims 21-23 and 29-33 as broadly claimed.

As to the processes of inactivating a DNA mismatch repair system of a plant cell, and compositions used in said processes, that read on the use of sense or antisense constructs, the following argument is made. Claims 21-23 and 29-33 read on processes using both sense and antisense constructs of claims 1-3 and 7-16. Applicant has provided limited guidance on inactivating a DNA mismatch repair system of a plant cell, only showing such inactivating in the homologous *Arabidopsis thaliana* plant. The expression of antisense constructs that suppress the expression of AtMSH3 in a plant is limited to *Arabidopsis thaliana*. The examples taught, that expression of an antisense construct to the homologous AtMSH3 gene in *Arabidopsis thaliana* will at least partially inactivate the DNA mismatch repair system in the cell, appear to be prophetic in Example 3, at pages 24-25 of the specification. In addition, the claims are broadly drawn to any DNA molecule that encodes a polypeptide functionally involved in the DNA mismatch repair system of a plant that is analogous to a mismatch repair polypeptide of a yeast or of a human, or to Applicant's AtMSH3. The art teaches that producing a desired phenotype in a plant transformed with a heterologous antisense construct is unpredictable and can lead to unpredicted molecular and biochemical phenotypes (see Colliver *et al* 1997, Plant Molecular Biology 35:509-522, particularly the Abstract on page 509). Hence, it would have required undue trial and error experimentation by one of skill in the art at the time of Applicant's invention to screen through a myriad of plants transformed with an antisense construct of a gene encoding Applicant's AtMSH3

protein, or fragments of said gene, to determine in which transformed plants the antisense construct would properly function to at least partially inactivate the DNA mismatch repair system of the transformed plant.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15. Claims 1-3 and 7-11 rejected under 35 U.S.C. § 102(a) as being anticipated by Culligan *et al* (1997, Plant Physiology 115(2):833-839).

The indefiniteness of the limitation "homologous" is discussed supra.

Culligan discloses an isolated DNA molecule comprising a polynucleotide sequence encoding a polypeptide (*atMSH2*) functionally involved in the DNA mismatch repair system of a plant that is "homologous" to a mismatch repair polypeptide of a yeast or of a human, and is "homologous" to AtMSH3 (SEQ ID NO: 19) (see Figure 1 on pages 834-835, and Figure 3 on page 837). Culligan also discloses isolation of a MSH6-like DNA fragment deposited in Genbank under the Accession Number AF009657) that would be "homologous" to Applicant's AtMSH3 (see page 838, left column, third paragraph). Culligan discloses that MSH3 and MSH6 proteins appear to have diverged from a common ancestral protein because of their overlapping function

(see page 838, right column, first paragraph). Hence, Culligan has previously disclosed all of the claim limitations.

16. Claims 1, 2, 7-10, 12-23 and 29-33 are rejected under 35 U.S.C. § 102(b) as being anticipated by Michiels *et al* (WO 96/26283).

Michiels discloses an isolated DNA molecule comprising a polynucleotide sequence encoding a polypeptide functionally involved in the DNA mismatch repair system of a plant encoding the ribozyme barnase, a chimeric gene comprising said DNA molecule, a plasmid comprising said chimeric gene and plants comprising said plasmid (see claims 1, 6 and 10). In addition, Michiels discloses a process for at least partially inactivating a DNA mismatch repair system of a plant by transforming a plant cell with said chimeric gene and expressing a barnase ribozyme that indiscriminately digests RNA. Hence, Michiels has previously disclosed all of the claim limitations.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 12-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Culligan *et al* (1997, Plant Physiology 115(2):833-839).

Because Culligan anticipates the DNA molecule of claims 1-3 and 7-11 as discussed supra, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of Applicant's invention to attach a regulation element, such as the 35S

promoter, to the cDNA encoding the atMSH2 protein, construct a transformation plasmid using said cDNA and transform a plant, especially *Arabidopsis thaliana*.

Conclusion

19. No claims are allowed.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is (703) 306-4539. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Amy Nelson can be reached at (703) 306-3218. The fax telephone number for this Group is (703) 872-9306 Before Final or (703) 872-9307 After Final.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Kim Davis whose telephone number is (703) 305-3015.

DAVID T. FOX
PRIMARY EXAMINER
GROUP ~~180~~ 1638

David H. Kruse, Ph.D.
17 May 2002